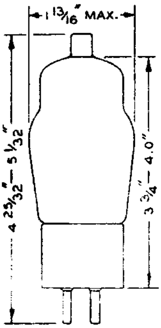
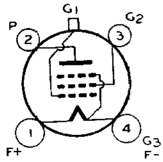


RCA-34

SUPER-CONTROL R-F AMPLIFIER PENTODE



The 34 is a super-control pentode recommended for use primarily as a radio-frequency amplifier and intermediate-frequency amplifier in battery-operated receivers where economy of filament-current drain is important. The 34 is very effective in reducing cross-modulation and modulation-distortion over the usual range of signal voltages without the use of antenna potentiometers or auxiliary volume-control switches. (See Super-Control amplifier, page 16.) This super-control characteristic makes the tube uniquely adaptable to the r-f and i-f stages of receivers employing automatic volume control.

CHARACTERISTICS

Filament Voltage (D. C.)			2.0	Volts
Filament Current			0.060	Ampere
Plate Voltage	67.5†	135	180 *max.*	Volts
Screen Voltage (Grid No. 2)*	67.5 *max.*	67.5 *max.*	67.5 *max.*	Volts
Grid Voltage, Variable (Grid No. 1)	−3 *min.*	−3 *min.*	−3 *min.*	Volts
Plate Current	2.7	2.8	2.8	Milliamperes
Screen Current	1.1	1.0	1.0	Milliamperes
Plate Resistance	0.4	0.6	1.0	Megohm
Amplification Factor	224	360	620	
Transconductance	560	600	620	Micromhos
Transconductance (At −22.5 volts bias)	15	15	15	Micromhos
Grid-Plate Capacitance (With shield-can)			0.015 *max.*	μμf
Input Capacitance			6.0	μμf
Output Capacitance			11.5	μμf
Bulb				ST-14
Cap				Small Metal
Base				Medium 4-Pin

* Under conditions of maximum plate current.
† Recommended values for use in portable receivers.

INSTALLATION

The **base** pins of the 34 fit the standard four-contact socket which should be installed to hold the tube in a vertical position. Although this tube is quite free from microphonic disturbances, cushioning of its socket may sometimes be desirable.

For **filament** operation, refer to INSTALLATION for type 1A6.

The **screen voltage** may be obtained from a tap on the B-supply battery or from a bleeder circuit across the battery, as a whole or in part. Due to the screen current characteristics of the 34, a resistor in series with the B-supply may be employed, if desired, for obtaining the screen voltage, provided the maximum voltage between screen and filament does not exceed 100 volts under conditions of reduced plate current.

Stage **shielding** enclosing all the components of each stage is, in general, necessary for multi-stage amplifier circuits.

APPLICATION

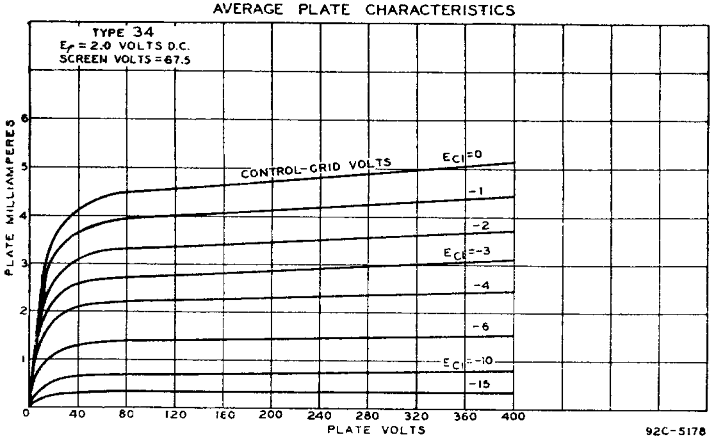
As an **r-f** or **i-f amplifier,** the 34 is applicable in receivers designed for it. Plate, screen, and minimum grid voltages are given under CHARACTERISTICS for a number of operating conditions.

Volume control of the receiver is accomplished effectively by variation of the negative voltage applied to the grid. In order to obtain adequate volume control, an available grid-bias voltage of approximately −22.5 volts will be required. The exact value will depend upon the circuit design and operating conditions. This voltage may be obtained from a potentiometer, a bleeder circuit, or a separate source, depending on receiver requirements.

Owing to the fact that the super-control feature of the 34 requires a comparatively large grid-bias change, the screen and plate voltage may vary considerably for various volume settings, depending on receiver design. It is recommended, therefore, that design features be incorporated in the receiver so that the screen voltage will not exceed 67.5 volts under conditions of minimum grid bias and maximum plate current. With a design arrangement of this kind, the screen voltage at decreased values of plate current may reach a value higher than 67.5 volts but should not exceed 100 volts. It should be recognized that under the condition of screen voltage above 67.5 volts at low plate current, an increase in the grid-bias voltage supply must be provided for adequate volume control.

As the **mixer** in superheterodyne circuits, the 34 may be utilized to advantage. It should be noted that by varying the grid bias on the mixer in conjunction with that on the radio-frequency and/or the intermediate-frequency stages, additional control of volume may be accomplished. Recommended conditions are: Plate voltage, 67.5 to 180 volts; screen voltage, 67.5 volts; grid-bias voltage, −5 volts approximately (with 4-volt oscillator peak swing).

AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS

